

Remarks

Claims 1-64 and 128 have been canceled, claims 65-127 and 129-139 are pending in the application. Applicant reserves the right to pursue the subject matter of the original claims in continuing applications.

I. Rejection of the Claims Under 35 U.S.C. § 112, Second Paragraph

Claims 65-127 and 129-139 stand rejected under 35 U.S.C. § 112, Second Paragraph, for failing to set forth the subject matter which applicant regards as their invention. (Office Action, page 2.) Applicant respectfully disagrees.

Claims 65 is asserted by the Examiner to be indefinite with respect to the term “substantially equal intensity.” (Office Action, page 2.) One skilled in the art upon review of the application would understand the meaning of the term “substantially equal intensity.” As an example, Figure 2 of the formal drawings submitted October 27, 2000 shows a banding pattern where the bands are of “substantially equal intensity” (see lane 1). Page 21, second paragraph of the specification, notes that the mass of DNA of the bands in the sample run in lane 1 of Figure 2 had been adjusted such that the bands stained with substantially equal intensity. In view of the above, the meaning of “substantially equal intensity” would be apparent to one skilled in the art. Thus, the application provides the basis for a “visual assay” for assessing band intensity.

Claim 85 is asserted by the Examiner to be indefinite with respect to the term “substantially equal relative mass.” A definition of relative mass is found in the second paragraph of the Detailed Description on page 8 of the specification and reads “[r]elative mass is defined as the ratio of each fragment mass compared to total mass of all fragments.” A definition of substantially equal relative mass is found on page 9, lines 8-9 of the specification as when one fragment is no more than 3 times the relative mass of another fragment. Lines 16-27, on page 9 of the specification provides an example of how these definitions may be applied in one embodiment. Applicant asserts that one of ordinary skill in the art, upon reading the specification, would be able to recognize the metes and bounds of claim 85.

The Examiner further asserts that the use of nucleotides as a unit of mass is indefinite. (Office Action, page 3.) Applicant asserts that nucleotide base pairs (bp) are a recognized unit of mass for nucleic acid molecules and that bp is used throughout the specification as a unit of mass. For example see lines 16-27, on page 9. One of ordinary skill in the art would recognize bp as a unit of mass for the purposes of interpreting the claims.

Claim 105 is asserted by the Examiner to be indefinite for the use of the term “substantially equivalent” and for how mass and copy number of fragments relate with respect to each rung of a nucleic acid ladder. (Office Action, page 3.)

Applicant has amended claim 105 to better define the relationship between mass and copy number of fragments for each rung of a nucleic acid ladder and to use the term “substantially equal” instead of “substantially equivalent.” The Examiners’ comments on the units of mass are addressed above.

Claims 101, 102, 121, 122, 125-127, and 129 stand rejected for insufficient antecedent basis for a limitation recited in the claim. (Office Action, pages 3-4.) Applicant has amended claims 101-105 and 121-27 so that the claim limitations have proper antecedent basis. Claim 129 has been canceled. Because the amendments corrected problems with antecedent basis, no new matter was added by the amendments.

Claims 129 and 134 stand rejected for being indefinite for the use of the terms “about the same” and “about the same intensity.” (Office Action, page 5.) Claims 129 and 134 are canceled herein rendering these grounds of rejection moot.

In view of the above, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of the claims under 35 U.S.C. § 112, Second Paragraph.

II. Rejection of the Claims Under 35 U.S.C. 102

Claims 65-82, 85-102, 105-122, 125-127 and 129-139 stand rejected under 35 U.S.C. §§ 102(b) and 102(f), as being anticipated by Carlson *et al.* (U.S. patent 5,316,908). (Office Action, page 5.) Applicant respectfully disagrees.

The Examiner asserts that Figure 1 of Carlson *et al.* discloses “a nucleic acid ladder that meets the size, relative mass and intensity requirements of claims 65-82, 85-102, 105-122, 125-127 and 129-139.” (Office Action, page 5.) As an initial matter, Applicant notes

that Figure 1 is a schematic diagram showing the relative migration of different sized bands, not an image of a stained gel. Thus, fluorescent band intensity is not the focus of this Figure.

Further, improvements of Carlson *et al.* are disclosed in Example 3. Such improvements include: (1) changes to probe DNA to allow easier labeling with DNA polymerase and altering its hybridization properties (column 5, lines 20-25); (2) changes to target DNA for more linear spacing (column 5, lines 52-54); and (3) increasing the amount of the target DNA for the largest and smallest bands to compensate for poor blotting performance (column 5, lines 55-60). While these improvements include changes to the amount of target DNA in the smallest and largest bands, this is to correct for problems in blotting performance, not staining intensity. None of these improvements are directed to producing bands that stain with “substantially equal intensity” as claimed in the present application.

In view of the above, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of the claims under 35 U.S.C. § 102.

III. Rejection of the Claims Under 35 U.S.C. § 103

Claims 83, 84, 103, 104, 123, and 124 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carlson *et al.* in view of Stanley (U.S. Patent No. 5,527,670). (Office Action, page 6.) Applicant respectfully disagrees.

As discussed above, Carlson does not disclose a nucleic acid ladder that has bands that stain with substantially equal intensity. Therefore Carlson *et al.* does not disclose all of the limitations of the claims. The Stanley reference does not cure the deficiencies of the Carlson *et al.* reference. Because the cited references do not teach or suggest all of the limitations of the claims the Examiner has failed to establish a *prima facie* case of obviousness.

In view of the above, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of the claims under 35 U.S.C. § 103.

Conclusion

Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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